

CLAIMS

1. An automatic vending machine for noodles, which automatically cooks noodles by receiving an ordering signal when a predetermined coin is inserted into a coin-operated mechanism, characterized by comprising:
 - 5 a main body 10 having a door 13 rotatably installed at an open front portion thereof, a middle partition 15 and a lower partition 16 which are installed in the main body 10 and are parallel with each other therein, in which a discharging hole 11 is formed through a one side of the door 13 and may be open or closed by a discharging door 12, and in which a through hole 14 is formed through a one side of the middle partition 15;
 - 10 a noodles storing member 30 for storing a plurality of metal disposable vessels 20 therein being installed at an inner upper portion of the main body 10 so that an open lower portion thereof is located above the through hole 14, in which noodles to be cooked and dressing materials are contained in the metal disposable vessels 20;
 - 15 a vessel supplying part 40 for discharging the metal disposable vessels 20 loaded in the noodles storing member 30 one by one being installed at the central partition 15 so that it is located between the through hole 14 and the noodles storing member 30;
 - 20 a vessel conveying part 70 for transferring the metal disposable vessels 20 being installed at the lower partition 16, in which the vessel conveying part 70 transfers the metal disposable vessel 20, which is discharged from the vessel supplying part 40, from an initial position(A) to a heating position(B), which is set on an upper surface of the heating member 50, when noodles has been cooked by pouring a hot-water into the metal disposable vessel 20 and by directly heating the metal disposable vessel 20 using the heating member 50, the vessel conveying part 70 transfers the metal disposable vessel 20 from the heating position(B) to an exhausting position(C);

a vessel discharging part 80 for discharging the metal disposable vessel 20, which is transferred to the exhausting position(C) due to operation of the vessel conveying part 70, to the outside through the discharging hole 11 of the discharging door 12, the vessel discharging part 5 80 being installed at a front portion of the vessel conveying part 70; and

10 a control part 90 for controlling the vessel supplying part 40, the vessel conveying part 70, the hot-water supplying part 60, the heating member 50 and the vessel discharging part 80 by receiving sensing signals generated from sensing means which senses operational states of the vessel supplying part 40, the vessel conveying part 70 and the vessel discharging part 80 and senses the temperature of the hot-water supplied from the hot-water supplying part 60.

2. The automatic vending machine for noodles according to claim 1, 15 wherein the hot-water supplying part 60 is installed in the main body 10, the hot-water supplying part 60 comprises:

a storage tank 62 for storing water supplied from an outer water source;

20 a heating tank 67 for heating water introduced from the storage tank 62;

a first valve 61 for controlling introduction of water from the storage tank 62 to the heating tank 67 being installed between the storage tank 62 and the heating tank 67;

25 a plurality of water level sensing sensor 63 for repeatedly sensing the level of water supplied from the storage tank 62 being installed in the heating tank 67;

a hot-water heating member 64 for heating water supplied from the storage tank 62 being installed in the heating tank 67;

30 a temperature sensing sensor 65 for sensing the temperature of water heated by the heating tank 67; and

a second valve 66 for controlling discharge of hot-water heated by the hot-water heating member 64 into the metal disposable vessel 20 located on the heating member 50, the second valve 66 being controlled by the control part 90.

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3. The automatic vending machine for noodles according to claim 1, wherein the vessel supplying part 40 comprises:

a link-operating part 44 including a pair of vessel-supporting links 44B, a pair of connecting links 44C, a reciprocating link 44D, and a first horizontal guiding member 44F, in which ends of the vessel-supporting links 44B are hingedly coupled with both sides of the first bracket 44A installed at the middle partition 15, both ends of the disposable vessel 20 are located over the vessel-supporting links 44B, the ends of the connecting links 44C are hingedly connected with the vessel-supporting links 44B, the other ends of the connecting links 44C are hingedly connected with both sides of the reciprocating link 44D, the first horizontal guiding member 44F for guiding the reciprocating link 44D in order to slide the reciprocating link 44D in the horizontal direction is installed at the middle partition 15;

a discharging part 46 for operating the link-operating part 44 including a second connecting rods 46A, a second rotating plate 46B, and a second driving member 46D, in which one end of the second connecting rods 46A is coupled with the reciprocating link 44D, the other end of the second connecting rods 46A is coupled with the second rotating plate 46B and the center thereof is eccentric to the second rotating plate 46B, the second rotating plate 46B is installed at the middle partition 15 by means of a third bracket 46C, the second driving member 46D for driving the second rotating plate 46B is installed at the third bracket 46C and is controlled by the control part 90; and

a vessel-supporting part 42 including a discharging supporting bracket 42A, a vessel-locating member 42B, a first connecting rod 42D, a

first rotating rod 42E, a first rotating plate 42F, and a first driving member 42G, in which the discharging supporting bracket 42A is installed at the lower partition 16 so that it is located below the lower portion of the through hole 14, the vessel-locating member 42B can slide through a space created 5 between the legs of the vessel-supporting link 44B upwards and downwards by a vertical guiding member 42C, the vertical guiding member 42C is installed in the discharging supporting bracket 42A, in which one end of the first connecting rod 42D is connected with the vessel-locating member 42B, the other end of the first connecting rod 42D is connected with one end of 10 the first rotating rod 42E, the first driving member 42G for driving the first rotating plate 42F in order to move the vessel-locating member 42B in the vertical direction is installed at the lower partition 16 and is controlled by the control part 90.

15 4. The automatic vending machine for noodles according to claim 1, wherein the vessel conveying part 70 comprises:

20 a pair of link members 72 having lower ends hingedly coupled with a pair of fourth brackets 72A, respectively, in which the fourth brackets 72A are installed on the upper surface of the lower partition 16 so that they are located at the lower part of the through hole 14;

25 a vessel-supporting member 74 having an open one side and lower sides hingedly coupled with the upper ends of the link members 72, in which the edge of the disposable vessel 20 transferred from the vessel supplying part 40 is snugly seated thereon and then it is supported

30 a vessel transferring driving part 76 including a third connecting rods 76A, a second rotating rod 76B, a third rotating plate 76C and a third driving member 76E, in which one end of the third connecting rods 76A is coupled with the link member 72, the other end of the third connecting rods 76A is coupled with on end of the second rotating rod 76B, the other end of the second rotating rod 76B is coupled with the third rotating plate 76C, in which

the third driving member 76E is installed at the lower partition 16 by means of the fifth bracket 76D, the third driving member 76E operates the second rotating rod 76B in order to move the vessel-supporting member 74 from the initial position (A) to the heating position (B), from the heating position (B) to 5 the discharging position(C), and from the discharging position(C) to the initial position(A), with maintaining the horizontal state of the vessel-supporting member 74.

5. The automatic vending machine for noodles according to claim 1, 10 wherein the vessel discharging part 80 comprises;

a second horizontal guiding member 82 being installed at an upper portion of a sixth bracket 82A, in which the sixth bracket 82A is installed at a front part of the lower partition 16 so that it is located at the lower portion of the exhausting position (C);

15 a vessel-discharging member 84 being installed on an upper surface of the second horizontal guiding member 82, in which the metal disposable vessel 20 transferred to the exhausting position (C) due to operation of the vessel conveying part 70 may be seated on the vessel-discharging member 84;

20 a fourth rotating plate 86 being rotatably coupled with one end of a fifth connecting rod 86A of which the other end is rotatably coupled with the vessel discharging member 84; and

25 a fourth driving member 88 for moving the fourth rotating plate 86 being installed at a one side of the sixth bracket 82A and being controlled by the control part 90, in which the vessel discharging member 84 moves toward the discharging hole 11 of the discharging door 12 with maintaining its horizontal state due to movement of the fourth rotating plate 86 driven by the fourth driving member 88.

30 6. The automatic vending machine for noodles according to claim 3,

wherein the vertical-guiding member 42C and the first horizontal guiding member 44F comprise a cylindrical bearing (BE) and guiding rods (RD) slidably coupled with the bearing (BE), respectively.

5 7. The automatic vending machine for noodles according to claim 3, wherein the vertical-guiding member 42C and the first horizontal guiding member 44F comprise an outer case (OCA) and an internal case (ICA), in which the internal case (ICA) can slide in the longitudinal direction by a plurality of bearings received in the outer case (OCA).

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8. The automatic vending machine for noodles according to claim 5, wherein the second horizontal guiding member 82 comprises two pair of discharging link members 82B, in which low ends of the discharging link members 82B are hingedly coupled with both upper sides of a sixth bracket 15 82A and upper ends of the discharging link members 82B are hingedly coupled with both lower sides of the vessel discharging member 84.

20 9. The automatic vending machine for noodles according to claim 5, wherein the second horizontal-guiding member 82 comprises an outer case 82C fixed to the upper surface of the sixth bracket 82A, and an outer case 82D which slides in the longitudinal direction by means of a plurality of ball bearings received in the outer case 82C.

25 10. The automatic vending machine for noodles according to any one of claims 1 to 5, wherein the control part 90 comprises:

 a first operating sensing member 91 for sensing operation of the vessel-locating member 42B;

 a second operating sensing member 92 for sensing operation of the vessel-supporting link 44B;

30 a vessel locating sensing sensor 98 being installed at both side

surfaces of the vessel-supporting member 74, the vessel locating sensing sensor 98 sensing a stable location of the disposable vessel 20 transferred by the vessel-locating member 42B such that edges of the disposable vessel 20 locates on edges of the vessel-supporting member 74;

5 a third operating sensing member 93 for sensing operation of the vessel-supporting member 74;

an exhausting position sensing sensor 94 being installed at the vessel discharging member 84, the exhausting position sensing sensor 94 sensing a stable location of the disposable vessel 20 onto the vessel 10 discharging member 84;

a fourth operating sensing member 95 for sensing operation of the vessel discharging member 84; and

a microcomputer 96,

wherein the microcomputer 96 applies an electric power to the first 15 driving member 42G when a coin inserting signal is generated from a coin-operated mechanism, the disposable vessels 20 are moved upwards due to ascending of the vessel-locating member 42B, when the first operating sensing member 91 senses an operation of the vessel-locating member 42B, the microcomputer 96 applies an electric power to the second 20 driving member 46D in order to widen the space provided between the legs of the vessel-supporting link 44B, when the second operating sensing member 92 senses an operation of the vessel-supporting link 44B, the microcomputer 96 applies an electric power to the first driving member 42G in order to downwardly move and then to stop the vessel-locating member 25 42B, the microcomputer 96 applies an electric power to the second driving member 46D in order to return the vessel-supporting link 44B to its initial position so that next disposable vessel 20 is locked in the vessel-supporting link 44B, when the second operating sensing member 92 senses the operation of the vessel-supporting link 44B, the microcomputer 96 applies 30 an electric power to the first driving member 42G in order to downwardly

move the vessel-locating member 42B to its initial position, and thereby the primary disposable vessel 20 is located on the vessel-supporting member 74, when the vessel locating sensing sensor 98 senses a stable loading of the disposable vessel 20, the microcomputer 96 applies an electric power 5 to the first driving member 92F in order to return the vessel-locating member 92B to its initial position, the microcomputer 96 applies an electric power to the third driving member 76E in order to move the vessel-supporting member 74 from the initial position(A) to the heating position(B), when the third operating sensing sensor 93 senses an operation of the 10 vessel-supporting member 74, the microcomputer 96 applies an electric power to the second valve 66 in order to open it for a predetermined time interval, when a predetermined quantity of hot-water is poured into the disposable vessel 20, the microcomputer 96 applies an electric power to the heating member 50 for a predetermined time interval in order to heat the 15 disposable vessel 20, after passing the predetermined time interval, the microcomputer 96 applies an electric power to the third driving member 76E in order to move the disposable vessel 20 from the heating position(B) to the exhausting position(C) and to return its initial position by means of the vessel-supporting member 74 in a state that the disposable vessel 20 20 maintains its horizontal state, when the exhausting position sensing sensor 94 senses a stable loading of the disposable vessel 20, the microcomputer 96 applies an electric power to the fourth driving member 88 in order to move the vessel discharging member 84 toward the discharging hole 11, and thereby the vessel discharging member 84 pushes the discharging door 25 12 outwards so that the discharging door 12 is open, when the exhausting position sensing sensor 94 senses a discharging operation of the disposable vessel 20, the microcomputer 96 applies an electric power to the fourth driving member 88 in order to return it to the exhausting position (C).

wherein the first, the second, the third and the fourth operating sensing members 91,92,93,95 comprise a limit switch, respectively.

12. The automatic vending machine for noodles according to claim 10,
5 wherein the first, the second, the third and the fourth operating sensing members 91,92,93,95 comprise a photo coupler for sensing a rotating angle of the first, the second, the third and the fourth rotating plates 42E,46B,76C,86, respectively.

10 13. The automatic vending machine for noodles according to claim 1, wherein the door 13 is provided with a chopsticks throwing device 100 comprising:

a seventh bracket 110 being installed inside of the door 13, in which a discharging hole 13A is formed there through;

15 a chopsticks receiving member 120 for receiving the chopsticks 13D packed in the connected wrapping paper being vertically installed on the seventh bracket 110 so that the opened lower portion thereof is placed on the discharging hole 13A, in which cut holes 122 are formed through the lower both sides of the chopsticks receiving member 120;

20 a cutting member 130 having cutting blades 134 formed to opposite with each other in an operating hole 132 formed at the center of the cutting member 130, and being installed on the seventh bracket 110 so that it is moved perpendicularly;

25 a chopsticks supporting member 140 for supporting the chopsticks 13D being downwardly moved, the chopsticks supporting member 140 being installed on both sides of the bottom surface of the cutting member 130 with a predetermined gap so that it is under the discharging hole 13A;

a sixth connecting rod 150 of which a one end is hingedly connected to one side of the cutting member 130;

30 a fifth driving member 160 being controlled by the controlling part 90

and rotating the fifth rotating plate 162 in setting angle so that the cutting member 130 is moved reciprocally; and

5 a discharging member 170 having a slanted surface 172 and being installed on the bottom surface of the seventh bracket 110, in which the chopsticks 13D being discharged from the discharging hole 13A of the seventh bracket 110 is discharged through the chopstick drawn out part 13N formed through the door 13.

14. The automatic vending machine for noodles according to claim 1,
10 wherein the door 13 is provided with a chopsticks throwing device 100 comprising:

an eighth bracket 210 being installed on the inner side of the door 13;

15 a chopstick saving member 220 being fixed installed on the eighth bracket 210, in which moving holes 222 are formed on both lower sides of the chopstick saving member 220 and then it is placed on a chopstick throwing part 13N formed on the door 13; and

20 a sixth driving member 230 being installed on one side of the eighth bracket 210, the sixth driving getting the discharging rod 232 being inserted into the moving hole 222 to reciprocally move, and it pushing the chopstick 13D filed on the chopstick saving member 220 and moving the chopstick 13D to the taking out part 13N.

15. The automatic vending machine for noodles according to claim
25 14, wherein the sixth driving member 230 comprises a solenoid.